

MODULARITY: A FORCE DESIGN METHODOLOGY FOR THE FORCE XXI DIVISIONAL MILITARY INTELLIGENCE BATTALION

A Monograph
By
Major William E. David
Military Intelligence



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School of Advanced Military Studies
United States Army Command and General Staff College
Fort Leavenworth, Kansas

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Abstract

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This monograph evaluates the concept for modularity as an alternative force design methodology. First, the monograph reviews current and emerging doctrine for evidence of modularity. The review concludes that modularity complements current doctrine and that emerging doctrine requires modularity. Second, the monograph looks at whether modularity provides the intelligence capabilities needed by the Force XXI division. Lessons learned from Operation DESERT STORM and the findings of the MI Relook Task Force reveal the required capabilities. Then, the 10th Mountain Division's operations in Somalia and Haiti provide evidence of the application of modularity vis-à-vis these capabilities. The division's operations demonstrate that modularity enables the MI battalion to provide the needed capabilities. Third, the monograph evaluates the divisional MI battalion for evidence of modularity, determining that it exhibits many of the traits indicative of modularity. This monograph concludes that modularity is an appropriate force design methodology for the divisional MI battalion in the Force XXI division.

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Major William E. David

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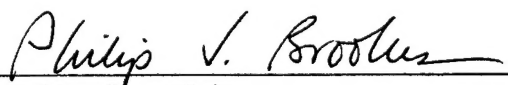
LTC Gregory M. Eckert, MS, MMAS

Monograph Director



COL Danny M. Davis, MA, MMAS

**Director, School of
Advanced Military
Studies**



Philip J. Brookes, Ph.D.

**Director, Graduate
Degree Program**

Accepted this 14th day of December 1995

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Chapter One

Introduction

A soldier...is like a sailor navigating by dead reckoning. You have left the terra firma of the last war and are extrapolating from the experiences of that war. The greater the distance from the last war, the greater become the chances of error in this extrapolation. Occasionally there is a break in the clouds: a small-scale conflict occurs somewhere and gives you a "fix" by showing whether certain weapons and techniques are effective or not: but it is always a doubtful mix... For the most part you have to sail on in a fog of peace until at the last moment. Then, probably when it is too late, the clouds lift and there is land immediately ahead; breakers, probably, and rocks. Then you find out rather late in the day whether your calculations have been right or not.¹

Michael Howard's analogy captures the Army's current predicament in contending with the Revolution in Military Affairs (RMA). The Center for Strategic and International Studies defines the RMA as "a fundamental advance in technology, doctrine or organization that renders existing methods of conducting warfare obsolete."² David Jablonsky, a professor at the Strategic Studies Institute, cautions that the challenge of the RMA is to blend properly continuity and change. To this end, he recommends thinking in time streams, a process advocated by Harvard professors Richard Neustadt and Ernest May.³ Thinking in time streams requires decision makers to imagine the future as if it were the past. The process identifies elements of continuity and change, helping planners to chart a course to the desired future.⁴ General Gordon Sullivan advocated thinking in time streams, stating that the Army's leadership should embrace the process to prepare the Army for the 21st century.⁵ Guided by his vision, the Army is responding to the RMA with the Force XXI concept. Force XXI is the "reconceptualization and redesign of the force at all echelons... to meet the needs of a volatile and changing world. It will be a force organized around information and information technologies."⁶

The Military Intelligence (MI) community's response to Force XXI is Intelligence

XXI. According to Fort Huachuca's vision statement, the purpose of Intelligence XXI is:

...to provide the Ground Component Commander, in a joint environment, with a knowledge based, prediction oriented intelligence system, supporting the commander driven requirements of an information age Power Projection Army (Force XXI) capable of land force dominance across the continuum of 21st Century military operations.⁷

Intelligence XXI envisions a seamless system of systems in which each echelon depends on the complementary systems found at other echelons. MI selected the term Intelligence XXI deliberately, showing the linkage to Force XXI. Like Force XXI, MI's new concept seeks to balance continuity and change. The Combat Electronic Warfare and Intelligence (CEWI) concept serves as MI's doctrinal continuity. Although the term CEWI is exiting the MI lexicon, Intelligence XXI builds on the existing CEWI structure. Hence, MI retains common organizational structures and provides organic assets to each echelon.

As MI prepares for the future, its leaders should recall that MI reinvented itself once before, resulting in the CEWI concept. CEWI was MI's response to its poor performance in Vietnam and lessons learned from the 1973 Arab-Israeli War. These two events, combined with MI's apparent disregard for the more methodical and integrated development of other Army organizations, led to the Intelligence Organizational Stationing Study (IOSS) published in 1975.⁸ The IOSS recommended future structures and functional responsibilities. In short, the study called for the provision of organic intelligence assets at each tactical level.

The IOSS complemented the 1976 version of Field Manual (FM) 100-5, Operations, which changed the Army's focus to armor operations in Europe.⁹ The coincident birth of CEWI reflected a similar emphasis on large and robust systems suited

to the defense of Europe against the Soviet threat.¹⁰ MI embraced CEWI as its guiding doctrine, providing an azimuth for force design in the 1980s. The enthusiasm for CEWI was evident in an article written in 1980 by one of the first CEWI battalion commanders. He concluded that:

The military heraldry office opposed the term CEWI because it lacks lineage. Many others prefer the title Military Intelligence battalion. True, we cannot trace our lineage to the War of 1812. But, if there is ever a modern battlefield, a next major war, there will be no doubt as to who or what CEWI is. We are preparing for that war, not for the War of 1812.¹¹

In spite of its optimistic birth, CEWI did not keep pace with subsequent changes to FM 100-5 that emphasized offensive operations in the guise of AirLand Battle doctrine. The continuing evolution of AirLand Battle following its introduction in 1982 created the delta between warfighters' expectations and MI's capacity to deliver. Although CEWI was MI's cornerstone doctrine in the 1980s, it grew increasingly out of touch with warfighters' needs. In particular, CEWI failed to complement the offensive nature of AirLand battle doctrine. As a former III Corps G2 stated:

the designers...of CEWI failed to anticipate our doctrinal evolution. Viewed in light of our emergent AirLand Battle doctrine, much of our expenditure of energy and heavy investment in force structure and systems development has led to hollow victories. MI...specifically the divisions' CEWI organizations-continues to follow a path that diverges from...AirLand Battle.¹²

He further noted that CEWI suited "static, linear defensive battles, where geometries are relatively predictable, line of sight easily discernible and where the enemy irreversibly commits himself to a single course of action."¹³ Also, MI ignored the warnings provided by force projection operations in Grenada and Panama, electing to stay the course with CEWI. When DESERT STORM loomed on the horizon, MI was unprepared. Accordingly, MI must reconsider the merits of CEWI as it transitions to Intelligence XXI.

Divisional MI battalions are transitioning to the A-series Table of Organization and Equipment (TOE) (see Appendix 1). The primary reason for this change was the lackluster performance of seven divisional MI battalions deployed in support of DESERT STORM. Their role in the Gulf led the Third Army G2 to conclude that "the MI Battalion (CEWI) concept is a good one, but it raises doubts since CEWI's contributions...were significantly less than expected."¹⁴ Warnings of CEWI's limitations surfaced as early as Operations URGENT FURY and JUST CAUSE. Unfortunately, MI did not modify its doctrine to accommodate the lessons learned from these operations. Rather, MI fell victim to the "inertia of history" or the tendency of organizations to avoid change even when the current way of doing things represents suboptimal continuity.¹⁵ The death knell of CEWI sounded during DESERT STORM, a warning that should have put an end to MI's rigid devotion to an obsolescent force design methodology. Nonetheless, the A-series TOE is a product of the CEWI design methodology. Thus, it preserves organic intelligence support at all echelons and provides for a common organizational structure. Although CEWI may provide continuity for MI, the demands of Force XXI require an end to CEWI's incumbency and a change in MI's force design methodology.

The hypothesis of this monograph is that the CEWI-based methodology is archaic in view of the Army's increasing reliance on force projection operations and the emphasis on Force XXI. As a result, while the A-series MI battalion corrects many of the deficiencies noted during DESERT STORM, it does so without necessarily meeting the demands of the Force XXI division. Modularity is a possible solution. As stated in Training and Doctrine Command Pamphlet (TRADOC Pam) 525-68, Concept for

Modularity, "modularity is a force design methodology which establishes a means of providing force elements that are interchangeable, expandable, and tailorable to meet the changing needs of the Army."¹⁶

This monograph argues that the concept for modularity should serve as the force design methodology for the MI battalion in the Force XXI division. The proof follows in the next four chapters. Chapter Two examines the modularity concept and answers two questions. First, does modularity complement current doctrine and, second, does emerging doctrine require modularity? The doctrinal review shows that the tenets of modularity appear often in current doctrine, indicating a complementary relationship. The review also shows that emerging doctrine requires modularity. Chapter Three answers the question: Does modularity provide the intelligence capabilities needed by the Force XXI division? The evidence indicates that modularity enables the MI battalion to provide the intelligence capabilities required now and in the future. Chapter Four uses the tenets of modularity as criteria to evaluate the A-series divisional MI battalion vis-à-vis the intelligence capabilities required by the Force XXI division. The criteria are responsiveness, economy of scale, effectiveness, and flexibility. The evaluation reveals that the battalion already exhibits many aspects of modularity. The evaluation also shows that the battalion can improve support to the Force XXI division by embracing modularity. Chapter Five synthesizes the findings from the preceding chapters, demonstrating the value of modularity as a force design methodology for the divisional MI battalion.

Chapter Two

Doctrine and Modularity

Victory smiles upon those who anticipate the changes in the character of war, not upon those who wait to adapt themselves after the changes occur.¹⁷

Guilio Douhet's words enjoin leaders to think in time streams. His words have resonance in doctrine that seeks to balance continuity and change. The Army's capstone manual, FM 100-5, Operations, strives for such a balance. It proclaims:

Never static, always dynamic, the Army's doctrine is firmly rooted in the realities of current capabilities. At the same time, it reaches out with a measure of confidence to the future. Doctrine captures the lessons of past wars, reflects the nature of war and conflict in its own time, and anticipates the intellectual and technological developments that will bring victory now and in the future...Throughout, doctrine reflects the adaptation of technology to new weapons systems and capabilities, organizations, missions, training, leader development, and soldier support. In this way, doctrine continues to be the Army's engine of change.¹⁸

Updated field manuals contain incremental changes to doctrine that proved effective in the past. Emerging doctrine will introduce sweeping changes to contend with the RMA and prepare the Army for the next century. In effect, the Army's leadership is using doctrine to drive and manage change such that victory may smile upon the Army in the future. The doctrinal review that follows shows that modularity is becoming increasingly important in Army doctrine. After more thoroughly examining the concept, the review proves that modularity complements current doctrine, and that emerging doctrine requires the Army to adopt modularity as its force design methodology.

The Concept for Modularity

The Army has changed its orientation from forward presence to force projection, resulting in enormous implications. As noted in TRADOC Pam 525-68, "force projection

around the world is a difficult task...commanders must often deal with force strength constraints, limits on available forces, dollar constraints, and limits on strategic lift..."¹⁹ As recent operations in Somalia and Haiti demonstrated, commanders often required a capability that did not warrant the deployment of the entire unit. However, partial deployments can render the parent unit incapable of performing its mission.²⁰ Modularity can help solve these problems.

Alvin and Heidi Toffler wrote that "changes in organizational structure in the armed services also parallel developments in the business world."²¹ Thus, the success of modularity in organizations such as Ford, Shell, and AT&T portends to afford similar benefits to the Army. Like the Army, these organizations are highly complex and desire both efficiency and effectiveness. They are also forward looking, seeking adaptive organizations to meet future challenges. The Army is considering the merits of modularity. As noted in TRADOC Pam 525-68, "modularity is a force design methodology which establishes a means of providing force elements that are interchangeable, expandable, and tailorable to meet the changing needs of the Army."²² In other words, its goal is to provide the correct functions and capabilities at the right place and time while leaving the parent units mission capable, albeit at reduced levels.²³

Modularity's three objectives are to:

- 1)...provide tailored functions and capabilities needed by force projection forces across the range of military operations.
- 2)...provide the methodology for the Army to achieve a force structure that will optimize rapid assembly of mission-oriented contingency forces that are effective and efficient.
- 3)...provide a means of rapidly identifying, mobilizing, and deploying doctrinally sound, sustainable, and fully mission-capable elements/

organizations capable of operating in a joint and combined environment.²⁴ These objectives complement the needs of the force projection Army, ameliorating problems such as fiscal and personnel constraints and strategic lift limitations.

The tenets of modularity further support its value as a force design methodology. The tenets are synonymous with the traits that modularity is intended to produce in organizations. Thus, modularity allows units to be responsive, economical, effective, and flexible. Responsiveness is related to time. A responsive unit provides the required capabilities on short notice. Economy is a function of the scale of effort required. Thus, an economical unit will deploy selected capabilities at a specific time until no longer needed. Economy of scale is important because of limited airlift and constraints on cost, personnel and equipment. Effectiveness results from adaptive force packaging based on mission, enemy, troops, terrain and weather, and the time available (METT-T). An effective unit meets the commander's needs and accomplishes the mission. Flexibility is a function of both the environment and the capabilities required by the mission. A flexible unit can operate in joint, multinational, and interagency environments. Flexibility also requires the unit to expand and contract according to the mission.²⁵ The tenets of modularity often surface in doctrine and serve as criteria for evaluating the MI battalion in Chapter Four.

There are many approaches to creating modular organizations. The two primary ones are functionally emulative increments (FEIs) and modular designed elements (MDEs).²⁶ As described in TRADOC Pam 525-68, FEIs are "organizations which are constructed with increments, so that each increment reflects the complete...functions of the organization."²⁷ FEIs look like miniature versions of the parent organization. Their

primary characteristic is that they can operate independently from the parent unit.

Depending on the mission, FEIs may provide a minimum amount of capability over a long period. Generally, FEIs are better suited to combat service support (CSS) organizations. For example, a Forward Support Battalion (FSB) sent a Forward Logistics Element (FLE) to Macedonia consisting of a headquarters element and increments of supply, medical, and maintenance support. The FLE was a functionally emulative increment (FEI), reflecting the whole of its parent's capability at a lower capacity. Since the operation did not expand, the FLE was adequate. However, the same FSB deployed a FLE to Kuwait to provide an initial capability in theater until the arrival of the rest of the unit.²⁸

TRADOC Pam 525-68 describes modular designed elements (MDE) as "organizations constructed with discrete elements of specific capabilities. The elements are specific parts/elements of the organization and, when combined, create the functional capability of the unit. In other words, each subordinate element does not mirror the functional capability of the entire unit."²⁹ MDEs facilitate adaptive force packaging by affording a more precise mix of required capabilities. No longer will large units need to deploy merely to provide the capabilities resident in only a small part of the unit. MDEs generally apply to combat and combat support organizations, but may apply to CSS units. For example, a Field Services Company may deploy a Laundry and Bath Platoon to support an operation. The platoon is an MDE because it provides the required functions only and does not reflect the whole of its parent's capability.³⁰ The design of most combat units already suits modularity. After all, combat units traditionally serve as the host for

modules of capabilities through the process of task organization. Combat support units are more problematic because their roles and requirements vary widely.³¹

Two factors are common to all approaches to modularity. First, modularity places heavy demands on automation systems. Personnel austerity and the need to process and manipulate large volumes of information mandate efficiency. The combination of efficiency and limited strategic lift assets requires smaller and more portable computers. Second, modularity needs communications for long distance transmissions.³² Frequently, a modular unit derives much of its capability from its parent unit. Regardless of the parent unit's location, assured communications link the modular unit to its parent. Computers and communication systems reflect the increasing importance of information technologies in force projection operations.

Current Doctrine and Modularity

The concept for modularity complements current doctrine. FM 100-5, Operations, is the Army's capstone doctrinal manual. Published prior to TRADOC Pam 525-68, the manual does not use the word modularity. However, its glossary defines modular units as "units comprised of multiple capabilities; depending on the requirement, modules can be added or subtracted from the unit or force package."³³ Modular units are a doctrinal precursor to modularity and bear directly on task organizing and force tailoring.

Task organizing can benefit from modularity. The Army defines task organization as "a temporary grouping of forces designed to accomplish a particular mission."³⁴ The problem with task organizing is that it creates force packages at the expense of units that stay behind. Thus, the residual portion of the unit may be inoperative because of the loss

of key personnel and equipment. The purpose of modularity is to provide a wider selection of discrete modules that enhance task organizing without debilitating parent units. Granted, the parent unit may lose some of its depth in personnel and equipment. It may also lose a capability for which it only had one module. However, the intent is to allow the parent unit to serve as more than a rear detachment. Modularity also aids force tailoring while preserving some parent unit capabilities. FM 100-5 explains force tailoring:

[as] the process of determining the right mix and sequence of units. Forces on quick alert may have little opportunity to tailor forces. Predesignated load plans might not precisely match the contingency for which they deploy. Their force packages, however, should include sufficient combat power to sustain and protect them for the short term, wherever they might go. Follow-on forces can be tailored to meet the specific concerns of the long-term mission."³⁵

In short, tailoring takes a task organized force and sequences its constituent elements for deployment. Often, a unit must deploy as a whole to provide a capability found in only a portion of the unit. The attendant excess in personnel and equipment places unnecessary demands on limited lift and disrupts effective sequencing because lift is allocated by unit and not function. Modularity reduces excess by providing only the capabilities required for the mission. Thus, modularity complements both task organizing and force tailoring by creating units that are responsive, economical, effective, and flexible.

FM 100-5 also makes frequent references to the tenets of modularity as desirable unit characteristics. For example, the manual states that responsiveness was tantamount to success "during Operation Just Cause, [when] the armed forces of the United States rapidly assembled, deployed, and conducted an opposed entry operation...the well-tailored force...simultaneously seized multiple key targets in Panama..."³⁶ In the MI context, "force projection operations need accurate and responsive intelligence...therefore, key

intelligence personnel and equipment must arrive in the theater early."³⁷ FM 100-5 states that commanders must consider the factors of METT-T "to select a force composition appropriate for the mission, build the team, and plan for simultaneous deployment and expeditious employment of the force."³⁸ The focus on mission success is captured in the tenet of effectiveness. Another example of how modularity supports varying mission requirements is flexibility. FM 100-5 says that "Army forces today are likely to encounter conditions of greater ambiguity and uncertainty. Doctrine must be able to accommodate this wider variety of threats."³⁹ Again, in the MI context, U.S. intelligence capabilities exceed that of most allies. Therefore, commanders operating in a multinational environment should build an intelligence system that accommodates the strengths of each nation, providing all units an accurate intelligence picture.⁴⁰ Clearly, FM 100-5 recognizes the importance of flexibility to accommodate disparate missions and varying conditions.

FM 34-1, Intelligence and Electronic Warfare Operations, is MI's capstone doctrinal manual. It is the product of a post-DESERT STORM assessment referred to as the MI Relook. The study analyzed CEWI's performance in the Gulf and forecast MI's future requirements in scenarios ranging from peacekeeping to war. The findings from the MI Relook led to MI's Force Design Update approved by the Army Chief of Staff in 1993. Thus, the 1994 version of FM 34-1 represents the first substantive change in MI doctrine since the advent of CEWI.⁴¹

Like the Army's capstone doctrine, FM 34-1 does not use the term modularity. However, it embraces the concept to an even greater degree than FM 100-5. Two of the five MI principles for force projection support are tactical tailoring and split-based

operations. FM 34-1 defines tactical tailoring as "the process used to determine what is the correct mix and sequence of deploying units."⁴² The tenets of modularity complement tactical tailoring. For example, FM 34-1 emphasizes that commanders must design their MI force packages according to the key force projection imperatives of flexibility, scalability, and tailorability.⁴³ The manual also cautions that "deployment of a more traditional unit such as a divisional MI battalion in full may not be the best organization for the mission."⁴⁴ Rather, FM 34-1 states that:

MI organizations are, or will be redesigned to take advantage of technology and incorporate lessons learned in order to better serve the needs of commanders. From theater MI brigade to direct support MI company, commanders are provided with a balanced, scalable, and flexible force which can be tailored to meet any contingency.⁴⁵

The A-series TOE is MI's first attempt at redesign.

Modularity also complements the principle of split-based operations. Again, the tenets of modularity are synonymous with the traits desired of units conducting split-based operations. For example, FM 34-1 notes that "in split-based operations, the commander deploys small, flexible, tailored" units that can access data bases and systems outside the area of operations and in joint, multinational, and interagency environments.⁴⁶ One of the key elements of split-based operations is the Deployable Intelligence Support Element (DISE). The DISE further illustrates the desirability of the traits afforded by modularity. The DISE supports split-based operations by creating a deployable, flexible, and scalable package that combines communications, computers, and broadcast downlinks.⁴⁷ Furthermore, as noted in FM 34-1, the DISE is "not a specific piece of equipment or a particular configuration of equipment. It is a flexible organization able to support any type of ground force commander."⁴⁸ In short, the DISE is MI's first venture with modularity.

Emerging Doctrine and Modularity

Emerging doctrine requires the concept for modularity. TRADOC Pam 525-5, Force XXI Operations, provides the Army with an intellectual stepping stone to future editions of FM 100-5. As such, it provides the conceptual framework for changing the Army into a knowledge-based, power projection force prepared for the challenges of the 21st Century. The authors of Force XXI recognized that continuity and change are endemic to Army doctrine. For example, the Force XXI concept links modularity to task organization, stating that:

The missions we receive today cause us to reconfigure and tailor our forces. This "task organization" is an inherent Army capability that we are enhancing by creating more modular forces that can be more readily configured for a wide variety of missions. We must be able to generate an effective, decisive force from diverse elements without undermining the capability of units that stay behind.⁴⁹

Modularity preserves continuity with emerging doctrine by linking itself to task organization, thus providing a new method of enhancing a proven concept.

TRADOC Pam 525-5 also embeds modularity in the five defining characteristics of Force XXI. The characteristics are doctrinal flexibility, strategic mobility, tailorability and modularity, joint and multinational connectivity, and the versatility to function in War and Operations Other Than War.⁵⁰ As noted earlier, modularity and tailorability mutually support one another. Also, flexibility to operate in joint and multinational environments is one of the tenets of modularity. However, modularity also relates to the other characteristics. For example, the Force XXI pamphlet states that "strategic lift limitations...demand forces that are as modular as logic allows..."⁵¹ The pamphlet adds

that "all Army forces must be rapidly deployable, highly survivable, lethal, agile, mobile, modular in design, and equipped to respond to the full range of military operations."⁵²

Although it is not authoritative, TRADOC Pam 525-5 provides the charter for instituting change, recognizing that the Army's force design methodology must change to adapt to the future. The pamphlet states:

The future Army will be smaller, yet have new, expanded, and diverse missions in an unpredictable, rapidly changing world environment. **These factors mandate change to the way we organize...[thus] combat support and combat service support must be modular [emphasis added], ...**These Force XXI units...will be modular in design, allowing the rapid tailoring of units to operate within any potential contingency situation in joint and multinational operations. **Based on these factors, experimentation in organizational design...will be essential...[emphasis added].**⁵³

Thus, the pamphlet says that the Army's organization will change, combat support and service support units will be modular, and experimentation in force design methodologies is critical. Unquestionably, the Army's most important emerging doctrinal text requires the concept for modularity.

TRADOC Pam 525-XX, Force XXI Division Operations Concept, is the first of the emerging doctrinal pamphlets to apply the principles advocated by TRADOC Pam 525-5. TRADOC Pam 525-XX provides an operations concept as a basis for development of Force XXI divisions. As such, it warns that "while the initial design of the fighting force is centered around the division, the very concept of what a current division is or does may be altered significantly."⁵⁴ Hence, the pamphlet provides the charter for experimenting with design at the division level.

TRADOC Pam 525-XX states that the Force XXI division will be organized around nine key principles. Two are particularly relevant to modularity. The sixth

principle says that the "division will be rapidly deployable, easily tailorable, sustainable, and operationally agile to allow force optimization, balance and versatility to conduct operations in the joint and multinational environment."⁵⁵ The seventh principle states that "the division will enhance tailorability through modularity across the force [which] will enable the detachment and acceptance of modules/units to adapt to changing METT-T conditions."⁵⁶ Thus, modularity and its tenets again find resonance in the underlying principles of the Force XXI division.

TRADOC Pam 525-XX also relates modularity to intelligence support. The pamphlet states that the commander must tactically tailor his intelligence support. The pamphlet adds that the resulting package must be flexible, putting "a premium on modularity, interoperability, and compatibility."⁵⁷ TRADOC Pam 525-XX also notes that "the division will have the means to focus and synchronize diverse intelligence systems...the modular design of intelligence units supports this concept."⁵⁸ The implications of the last statement are that modularity is already present to some degree in MI units and that the Force XXI division requires modular MI units.

The Army uses doctrine to drive and manage change. However, the Army's leadership also uses the process of thinking in time streams. Consequently, doctrine seeks to balance continuity and change. The doctrinal review demonstrated that modularity complements current doctrine. In addition, it showed that emerging doctrine requires modularity as the force design methodology for Force XXI. Since the focus of this monograph is the divisional MI battalion, the question arises of whether modularity provides the intelligence capabilities needed by the Force XXI division?

Chapter Three

Intelligence and Modularity

Yes, we have slain a large dragon. But we live now in a jungle filled with a bewildering variety of poisonous snakes. And in many ways, the dragon was easier to keep track of.⁵⁹

The strategic environment has changed and, as suggested above, the change provides the Army with an array of challenges marked by ambiguity and uncertainty. Operations in Southwest Asia, Somalia, and Haiti typify demands faced by today's Army while foreshadowing the requirements of the future. MI's challenge is to anticipate future requirements. Accordingly, this chapter shows that modularity provides the intelligence capabilities needed by the Force XXI division. The argument unfolds in three sections. The first section looks at the findings of the MI Relook Task Force, focusing mostly on DESERT STORM. The second section discerns the capabilities required by the Force XXI division from doctrine and the lessons noted in the first section. The third section looks at modular applications that provided the requisite capabilities to the 10th Mountain Division (10th MTN DIV) during recent operations.

The MI Relook Task Force and DESERT STORM

The Army chartered the MI Relook Task Force to analyze intelligence operations through DESERT STORM and determine how to organize units, equipment, and procedures to posture MI for success in myriad threat environments. The task force conducted its analysis from June through September 1991, soliciting help from the Rand Corporation.⁶⁰ The task force focused on DESERT STORM, but provided a balanced assessment by drawing on lessons learned from all previous operations. In general, Rand

concluded that MI was too focused on signals intelligence (SIGINT). This focus resulted in MI's mixed performance in DESERT STORM, allowing General Schwarzkopf to make two seemingly contradictory statements. On the one hand, he said that "the great military victory we achieved...can be directly attributed to the excellent intelligence picture we had on the Iraqis."⁶¹ On the other hand, he told the Senate Armed Services Committee that "we just don't have an immediately responsive intelligence capability that will give the theater commander near-real-time information that he personally needs to make a decision."⁶² Both statements were accurate.

General Schwarzkopf's praise for MI arose from the success of theater and national level intelligence assets. Prior to DESERT STORM, the accepted paradigm was that intelligence percolates upward from organic intelligence units present at each tactical level. However, the war demonstrated the opposite phenomenon as echelons above corps (EAC) assets dominated the collection effort. Space-based systems and the Joint Surveillance and Target Attack Radar System (JSTARS) best exemplify the role of EAC assets. Space-based assets provided critical intelligence before U.S. forces arrived in Southwest Asia. These systems also gave units accurate locational data, early warning of tactical ballistic missile launches, and robust communications pathways. General Donald Kutyna, the Commander-in-Chief of U.S. Space Command, noted that "DESERT STORM was the first campaign-level combat operation where space was solidly integrated into combat operations."⁶³ JSTARS demonstrates the value of an airborne collection platform that both collects critical intelligence and provides targeting data. Major General

Stewart, Third Army G-2 in DESERT STORM, best summarized the performance of JSTARS, noting it:

...was the single most valuable intelligence and targeting collection system...It gave the first and continuous signs of Iraqi withdrawal from Kuwait and was the target development instrument we used for the Air Force attack of fleeing Iraqi convoys on the main road north of Al Jahra. JSTARS showed the Republican Guards heavy divisions establishing their defense of Basrah.⁶⁴

Thus, DESERT STORM foreshadowed the increasing importance of EAC assets.

CEWI's failures in DESERT STORM provide abundant evidence for General Schwarzkopf's negative comment while yielding important lessons for the future of MI. CEWI's failure in the war was due largely to its reliance on SIGINT. The focus on SIGINT, and the corresponding lack of human intelligence (HUMINT) and imagery intelligence (IMINT), reflected a decade long focus on the Soviet threat. There were two problems with the dependence on SIGINT. First, the Iraqis did not produce a SIGINT-rich environment because of the effectiveness of the coalition air campaign.⁶⁵ Second, ground-based SIGINT systems were poorly suited for fast paced, offensive operations. The experiences of the 501st MI Battalion are representative of the CEWI battalions that deployed to DESERT STORM. The battalion supported 1st Armored Division. However, its SIGINT assets provided minimal intelligence. Struggling to keep pace with the maneuver brigades, the assets were unable to stop long enough to set up and operate.⁶⁶ Inadequate HUMINT and IMINT assets further underscored CEWI's impotence in the war. As Major General Stewart noted, DESERT STORM "placed high demands on counterintelligence..., prisoner interrogation and civilian interview, and high resolution, real-time imagery."⁶⁷ Yet, CEWI's decade long focus on SIGINT had correspondingly degraded its HUMINT and IMINT capabilities.

The most significant failure of CEWI in DESERT STORM was its inability to disseminate intelligence products on a timely basis and in the format desired by warfighters. As the Tofflers commented:

A great deal of information was streaming in from satellites and other sources, but analysis was slow and, lacking adequate communications capacity, photo overlays showing Iraqi ground positions and barrier constructions did not reach the units needing them for twelve to fourteen days.⁶⁸

Colonel Quick's experiences further illustrate the dissemination problem in DESERT STORM. He wrote that:

Our inability to get photos on "The Great Dismal Bog," was... distressing. In the initial plan, we would attack to the Euphrates River Valley at the city of As Samawah and sever the main highway from Baghdad to An Nasiriyah. We would then turn east and attack along the river to Basrah. We urgently requested information about trafficability across the low ground south of the river. We received no imagery, only analytical comments stating that trafficability was good.⁶⁹

Unable to get the imagery, the division discovered that the bog was larger than expected and that the possible crossing sites identified in the analytic comments were impassable.⁷⁰

CEWI's inability to adequately disseminate intelligence stemmed from technical shortfalls and hierarchical dependencies. Technically, dissemination relied largely on communications and automation systems suited to text and voice. However, the Gulf War demonstrated that commanders prefer pictures. Unfortunately, the dissemination system was unable to handle large volumes of imagery and graphics. In spite of the wealth of EAC intelligence products, the lack of secure communications assets denied timely delivery of many of these products to tactical commanders.⁷¹

The hierarchical structure of CEWI also hampered dissemination. Each echelon became a node through which intelligence passed to reach the next node. This cascading architecture tended to stovepipe information, creating backlogs at each echelon. CEWI

avored the hierarchical flow of intelligence because it assumed that each echelon benefited from the intelligence or value added by other echelons. Hence, dissemination almost came to a standstill as the volume of intelligence eclipsed all expectations.⁷²

The exemplary performance of EAC assets and the poor performance of CEWI assets and dissemination systems in Southwest Asia seem to suggest that tactical assets are of waning value. The MI Relook Task Force disagreed, acknowledging the importance of lessons learned from DESERT STORM while also recognizing that the Iraqis were but one type of threat and the Gulf but one type of environment. Thus, the task force took a broader perspective. It looked at MI's record since 1982. Wisely, it came to the same conclusion as Lieutenant General Eichelberger, Deputy Chief of Staff for Intelligence during DESERT STORM, who noted that:

the Kuwaiti Theater of Operations was very much like a pool table. It's one of the few places on earth where you can really do a great intelligence job almost exclusively from space. For this reason...we should be very careful about generalizing on the lessons learned in Southwest Asia.⁷³

Colonel Richard Quirk, G2 for the 24th Infantry Division (Mechanized) during DESERT STORM, added that:

it would be unwise to generalize too much about the roles of higher level agencies versus tactical collectors from this experience. This was an exceptionally lucrative opportunity for national systems. The open, desert terrain and the defensive, mechanized enemy force enhanced the value of imagery-derived intelligence.⁷⁴

Accordingly, the MI Relook Task Force commissioned the Rand Corporation to study future intelligence requirements. The Rand study used eleven scenarios to model a broad range of operational contexts. They used both combat and noncombat operations in varying terrain and weather conditions, putting them in the context of multinational, UN sponsored, or U.S. only operations.⁷⁵ The findings for combat operations temper the

euphoria over EAC systems. For example, the study said that IMINT, including JSTARS, is valuable in "short-term situations involving frequent, more continuous operations of a military or paramilitary nature."⁷⁶ In particular, IMINT systems will dominate collection in open terrain like Kuwait against largely mechanized forces like the Iraqis. Hence, DESERT STORM postured JSTARS for success, allowing IMINT to provide the key intelligence reads of the war. However, Rand noted that IMINT, including JSTARS, has a limited role in missions marked by:

small, lightly armed threat entities...with few if any major combat vehicles [and in] operations conducted in the midst of normal, ongoing civilian activity where threat movement blends in with larger and more dense quantities of commercial movement.⁷⁷

Clearly, the threat spectrum model shows that DESERT STORM-like scenarios may be an anomaly and that conditions less favorable to JSTARS are equally possible. Furthermore, in conditions unfavorable for the use of IMINT systems, Rand found that HUMINT assets dominate the collection effort.

The findings also noted that aerial SIGINT systems are more useful than ground-based systems because of their wider area of coverage and depth of intercept. The study added that augmenting aerial systems with ground-based systems has value only in those regions where weather is a problem. Thus, the ground based systems present in the Gulf were unnecessary given the availability of aerial systems, adequate weather, minimal air threat, and the degraded SIGINT environment.⁷⁸

The findings for noncombat scenarios are particularly important given the recent proliferation of OOTW missions. The findings concluded that HUMINT has the highest value for noncombat operations "characterized by infrequent operations by small units or

groups."⁷⁹ IMINT serves a supporting role while SIGINT has limited value because of "the sporadic nature of communications and infrequent maneuvering of standard military forces."⁸⁰ The report did note two exceptions to its SIGINT findings. First, some ground-based SIGINT assets have value when a signals database reveals sporadic use by the enemy on limited frequencies. Second, "for standoff and remote operations in long duration, static, noncombat settings," an all-weather aerial platform has value.⁸¹

The study also considered the dissemination lessons learned from the war. In particular, Rand noted that "a form of broadcast is considered more reliable than a multi-nodal, multi-echeloned hierarchy."⁸² However, as with its other conclusions, Rand cautioned that the Gulf provided a unique set of conditions. The Rand report made two recommendations to address both the range of threat scenarios and the realities of limited resources. First, intelligence should flow hierarchically only when each echelon adds value to the product and there is not an immediate need for information. The hierarchical flow is also appropriate for managing limited collection assets, providing each echelon with input to their use. Second, the broadcast of intelligence to multiple echelons is preferred when dealing with targeting information, indications and warning (I&W), and perishable intelligence of immediate importance.⁸³

Intelligence Capabilities and the Force XXI Division

This section begins with the caveat that the Force XXI division does not yet exist. Although a division at Fort Hood is experimenting with Force XXI, the concept remains unproven.⁸⁴ Consequently, this monograph discerns the intelligence capabilities required by the Force XXI division from doctrine, lessons learned from DESERT STORM, and the

findings of the MI Relook Task Force. Also, this monograph assumes that these capabilities will remain applicable to an actual Force XXI division.

The capabilities that modularity must provide are not the same as the intelligence needs of the Force XXI division. Intelligence needs refer to the discrete tasks that MI performs to fulfill its combat function. Thus, MI provides I&W, intelligence preparation of the battlefield (IPB), situation development, target development and support to targeting, force protection, and battlefield damage assessment (BDA).⁸⁵ This monograph assumes that MI will perform the same tasks for the Force XXI division and thus does not identify new tasks.⁸⁶ Capabilities relate to MI's ability to support a specific mission in a given environment. For example, an MI battalion may have the capability to collect IMINT in a desert environment, but lack the same capability in a jungle environment.

MI must provide three capabilities to support the Force XXI division. First, the Army's reliance on force projection mandates that **MI must provide intelligence support to force projection operations**. The drawdown in forces and the withdrawal from overseas locations place a premium on force projection operations. TRADOC Pam 525-XX states that force projection will be the first step in all Force XXI operations.⁸⁷ However, the requirement to project forces puts MI in competition with other units vying for the same limited strategic lift assets. In some cases, commanders may prefer logistics units initially to set the stage for reception, staging, and onward movement. In forced entry operations, commanders may prefer combat units to create favorable conditions for follow on units. MI's challenge is to reduce its in-theater footprint without reducing its effectiveness. Split-based operations offer a means of reducing the footprint because:

...the commander deploys a small, flexible, tailored team called a

DISE [Deployable Intelligence Support Element]. The DISE deploys with the initial entry commander and has the capability to access intelligence data bases and systems outside the AO [area of operations]. The DISE provides the commander with a link from his forward deployed force to an intelligence support base located in CONUS or other locations outside the AO.⁸⁸

Therefore, the DISE provides effective and efficient support, minimizing its share of limited lift assets. Then, as lift becomes available, the DISE expands according to the needs of the commander. Recent deployments to Somalia and Haiti demonstrate that MI must be able to support force projection operations to diverse theaters.

Second, **MI must provide intelligence support to the spectrum of military operations in all terrain and weather conditions.** Emerging doctrine details the myriad operations that the Force XXI division must perform. TRADOC Pam 525-XX states that the division may participate in general war, major and lesser regional conflicts (MRCs/LRCs), and operations other than war (OOTW).⁸⁹ TRADOC Pam 525-5 is more specific regarding the range of missions. It provides a threat spectrum model that illustrates the environments in which the Force XXI division may operate, pitting the U.S. against complex-adaptive, armor-mechanized, or infantry-based enemies. The model also includes an array of OOTW, including environmental disasters, famine, health epidemics, and population dislocation.⁹⁰ The significance of the model is that MI can no longer focus on a single threat. Nor can MI content itself by preparing for only a portion of the threat model spectrum. Rather, MI must redesign itself to accommodate the entire spectrum.

The findings of the MI Relook Task Force also promote the value of intelligence support across the spectrum of operations. Perhaps, the most important point is the absence of a single model against which to design MI capabilities. Thus, as noted in the Rand report, the "Army should refocus its intelligence programs according to mission

requirements of anticipated contingencies and rebalance system types and quantities appropriately."⁹¹ In addition, the report states that the refocus should increase IMINT, HUMINT, and measurement and signature intelligence (MASINT) capabilities while reducing SIGINT systems to correspond to the more likely threat environments.⁹² All of these capabilities need not be resident at a given echelon and not all of these capabilities will be required for all missions. However, warfighters must have access to all relevant systems regardless of the echelon to which the systems are organic.

Third, **MI must disseminate intelligence to warfighters.** Simply stated, effective intelligence collection and analysis are meaningless unless the products get to the people who need them. Emerging and current doctrine recognize the importance of dissemination. TRADOC Pam 525-5 states that:

new communications systems allow nonhierarchical dissemination of intelligence...at all levels. This new way of managing forces will alter, if not replace, traditional, hierarchical command structures with new, internetted designs.⁹³

TRADOC Pam 525-XX adds that "the use of automated and broadcast dissemination systems will provide multiple echelons a common intelligence picture of the battlefield."⁹⁴ MI has embraced broadcast dissemination, noting that "broadcasting facilitates the direct or skip echelon 'push' of information down to commanders in the field."⁹⁵

The findings of the MI Relook Task Force reinforce the requirement for broadcast dissemination. Although EAC assets performed well in DESERT STORM, products took days to reach forward tactical units. Electronic dissemination of IMINT was sparse because of the heavy demands it placed on an already overburdened communications system. In addition, the hierarchical and nodal structure of CEWI hindered the passage of

information. As the units attacked and pushed beyond the distance threshold of tactical communications, intelligence dissemination virtually ceased.

Emerging doctrine, lessons learned from DESERT STORM, and the findings of the MI Relook Task Force show that the Force XXI division requires three critical intelligence capabilities. Thus, MI must be able to support force projection operations, provide intelligence to the spectrum of military operations in all terrain and weather conditions, and disseminate intelligence to warfighters. Lessons learned from the Gulf demonstrate that CEWI is not the best force design methodology for meeting the required capabilities. However, DESERT STORM does not tell the entire story. Therefore, the conclusion of the Rand study has particular merit. It notes that MI is best able to provide these capabilities when:

configured in sets or packages, the designs of which are tailored to the expected mission and regions where they will be employed. Packages should be designed to feature the most important "INTs" for the mission and region, adding the other collection capabilities to the extent they contribute measured value. This means that for some regions-the packages will feature HUMINT collection, while the other collection functions-for example, SIGINT, IMINT, MASINT-are intended to perform supportive roles. This approach is contrasted with representing and employing each "INT" to its full capacity at all command echelons in equally dominant roles.⁹⁶

Since the Force XXI division requires all three intelligence capabilities and DESERT STORM discredited CEWI, can modularity provide the required capabilities?

Intelligence Capabilities and Modularity

The 10th MTN DIV's participation in Operations RESTORE HOPE (Somalia) and UPHOLD DEMOCRACY (Haiti) provides evidence that modularity can yield the required capabilities. Both operations serve as appropriate examples because the Force

XXI division is likely to conduct similar missions. For example, Haiti meets the description of future operations cited in the Rand report. The report stated that:

in future environments, the fast pace of unfolding crisis situations, combined with an expected low density of threat entities, will require increasing precision, more timeliness, and higher ability to discriminate threat entities intermingled with civilian population and infrastructure.⁹⁷

Both examples also fit TRADOC Pam 525-5's threat spectrum model as likely operations in the future.⁹⁸

The term modularity probably did not surface in 10th MTN DIV's predeployment planning. Nor did the G2 think in terms of modularity when he packaged his intelligence support. Nonetheless, the division used two applications of modularity.⁹⁹ First, the G2 built intelligence support around the DISE. Second, the division created intelligence support packages, consisting of specific assets. The combination of these two modular practices provided the requisite capabilities to the division.

The 10th MTN DIV used the DISE in both Somalia and Haiti. As discussed in Chapter Two, the DISE is a flexible organization that brings together communications, automated intelligence fusion, and broadcast downlinks in a small package capable of deploying with early entry forces. It is a tactically tailored team that supports the early entry force G2/S2 and is configured according to the mission, threat, and lift restrictions.¹⁰⁰ The DISE allowed the G2 to provide continuous intelligence support to force projection operations using a split-based configuration. The division's DISE consisted of selected personnel from the G2's Analysis and Control Element (ACE), the All-Source Analysis System (ASAS), and the TROJAN Special Purpose Integrated Remote Intelligence Terminal (SPIRIT). The TROJAN communications network is a

satellite based system used to provide intelligence via secure voice, data, and facsimile.

TROJAN SPIRIT was the critical component of the DISE in Somalia. It provided access to theater and national level intelligence collectors and processors regardless of their locations. The Center for Army Lessons Learned (CALL) noted that:

The success of the TROJAN SPIRIT cannot be overstated...TROJAN SPIRIT facilitated a split-based intelligence operation. **The ARFOR G2 deployed only 15 of 67 staff members** [emphasis added], leaving the balance at Fort Drum processing, analyzing, and forwarding intelligence products to Somalia via TROJAN SPIRIT.¹⁰¹

The 10th MTN DIV used a slightly different DISE configuration in Haiti because the G2 expanded into a Joint Intelligence Center (JIC), requiring 150 people. The division initially deployed a DISE. Then the DISE expanded, bringing more personnel from Fort Drum and relying extensively on modular support packages provided by higher echelons. Since most of the division's G2 staff deployed, the XVIIIth Airborne Corps' Corps Military Intelligence Support Element (CMISE) provided JTF-190 with a modular element called the Intelligence Support Element (ISE). The CMISE linked the corps to the CMISE's parent unit, the theater level 513th MI Brigade. Similarly, the ISE augmented the 10th MTN DIV DISE and linked the division to corps and higher level intelligence assets.¹⁰² Since two Army-based JTFs supported operations in Haiti, straining the abilities of the 513th MI Brigade, strategic agencies also deployed National Intelligence Support Teams (NISTs) to each JTF. As a result, JTF-190 received another modular support package consisting of personnel and equipment from the Defense Intelligence Agency, the Central Intelligence Agency, and the National Security Agency.¹⁰³

Modularity also affected 10th MTN DIV's capability to deploy specific intelligence systems tailored to match the threat environment and terrain conditions unique to Somalia

and Haiti. In Somalia, 10th MTN DIV used the DISE concept, but did not use modularity to create a balanced package of HUMINT, SIGINT, and IMINT assets. For example, Somalia was a HUMINT rich environment. As Major General Arnold, commanding general of 10th MTN DIV, said, "...our counterintelligence [CI] agents were our major source of intelligence information that shaped maneuver operations."¹⁰⁴ The CI teams conducted Low Level Source Operations, elicitation, debriefings, screening operations, and assisted with force protection.¹⁰⁵ However, 10th MTN DIV HUMINT teams did not arrive in theater until two weeks after the division headquarters. The competition for limited lift assets prevented early deployment of HUMINT teams.

Similarly, the division did not deploy any SIGINT or IMINT assets. The limited assets in theater belonged to the Marines and were critical to operations in Mogadishu. Without SIGINT assets, the division could not exploit the lucrative long-range radio communications between warring factions, a source of intelligence that could have cued HUMINT teams. The story repeats itself with IMINT assets. Although national assets provided some IMINT, the small, easily disguised Somali target was not a suitable target for national assets. Rather, as noted by CALL, the division needed UAVs to provide a "dedicated, surreptitious day/night imagery system with long loiter time to provide near real-time reporting."¹⁰⁶ Had 10th MTN DIV deployed some SIGINT and IMINT assets, the quality and timeliness of HUMINT would have improved.

The 10th MTN DIV recalled the lessons learned from Somalia when it deployed to Haiti. Accordingly, the division considered METT-T and created a balanced intelligence package suited to the environment. As in Somalia, HUMINT was the primary intelligence

source. However, unlike Somalia, HUMINT teams deployed to Haiti with initial entry forces, providing critical intelligence support early in the operation.¹⁰⁷

The division also weighed the relative importance of SIGINT and IMINT, concluding that they enhanced HUMINT. Based on an assessment of the radio frequencies used by Haitian officials and government sponsored organizations, the MI battalion realized that its organic SIGINT systems were inadequate. Therefore, it bought off the shelf radio scanners, using them to provide 94 intelligence reports and four critic reports. Another valuable SIGINT source was the Low Level Voice Intercept Team (LLVI) equipped with radio intercept systems or radio scanners. LLVI teams worked in conjunction with HUMINT teams in remote areas.¹⁰⁸

IMINT also provided valuable support in Haiti. According to CALL, live video imagery from platforms such as the Airborne Reconnaissance Low (ARL) allowed units to "overwatch objectives during assaults, providing them a capability to look down adjacent lots or streets in urban operations or over the next hill in rural maneuvers."¹⁰⁹ Also, EAC imagery products came to JTF-190 in soft copy via the TROJAN SPIRIT with embedded Joint Deployable Intelligence Support System (JDISS) software.¹¹⁰

The 10th MTN DIV's recent experiences demonstrate that the application of modularity provides the intelligence capabilities needed by the Force XXI division. The DISE is a proven modular concept that excelled in both Somalia and Haiti because it adapted to the unique conditions of each environment. The DISE supported force projection operations and facilitated dissemination from national through tactical level sources. As deployed in Somalia, the DISE was a functionally emulative increment (FEI),

reflecting the capabilities of its parent unit without disabling it. In Haiti, the DISE was a FEI that expanded into a Joint Intelligence Center analogous to the FLE-FSB example in DESERT STORM. Learning from its operations in Somalia, 10th MTN DIV also used modularity to configure an intelligence support package tailored to Haiti. This ad hoc package featured HUMINT as the primary collector and used SIGINT and IMINT to perform supportive roles. Each of the functions performed by the package was essentially a modular designed element (MDE). For example, the Airborne Reconnaissance Low (ARL) was a MDE that came from the 513th MI Brigade. The ARL MDE did not reflect the whole capability of the brigade, nor did it debilitate its parent unit. The creation of tailored MI packages supports the capability to effectively support any contingency.

Again, the division did not deliberately set out to apply the concept for modularity. Rather, the need to provide the three basic intelligence capabilities required the division to reconsider its traditional CEWI-based approach to intelligence support. Hence, the division turned unknowingly to modular approaches. Since modularity was effective in the two most significant intelligence deployments since DESERT STORM, the question surfaces of whether the A-series MI battalion embraces the concept for modularity?

Chapter Four

The Divisional MI Battalion and Modularity

A general should neglect no means of gaining information of the enemy's movements and for this purpose, should make use of reconnaissance, spies, bodies of light troops commanded by capable officers, signals, and questioning deserters and prisoners.¹¹¹

The purpose of this chapter is to evaluate the emerging A-series divisional MI battalion for evidence of modularity. Consistent with the Army's emphasis on Force XXI, this chapter considers the battalion within the context of Intelligence XXI. This chapter consists of three sections. The first section explains Intelligence XXI's primary feature, the Intelligence System of Systems. The second section describes the organization and capabilities of the battalion, revealing that it retains some CEWI features. The third section evaluates the battalion for evidence of modularity as a means to provide the intelligence capabilities needed by the Force XXI division.

Intelligence XXI and the System of Systems

Jomini's words implore commanders to reduce uncertainty on the battlefield. Yet, the means available to reduce uncertainty at a particular echelon may not be adequate. MI recognizes that the organic intelligence assets located at each echelon cannot provide the capabilities required by the Force XXI division under all conditions. MI's solution is Intelligence XXI. As noted in Chapter One, Intelligence XXI envisions a seamless system of systems in which each echelon is dependent on the complementary systems found at other echelons. Thus, the Intelligence System of Systems is the mechanism for providing intelligence support to Force XXI. The system uses communications and automation to access the organic assets at other echelons. The resulting interface between intelligence

units at different echelons provides the requisite support to commanders. The Intelligence System of Systems has the following characteristics:

1. It is a flexible and tailorable architecture of procedures, organizations and equipment focused on a common need--the combat commander's information needs.
2. [It] complements and reinforces each echelon's organic capabilities and, when necessary, provides direct support (DS) to commanders whose organic intelligence capabilities cannot be brought to bear. Inherently, any commander can benefit and be supported by these capabilities, based on need and priority.
3. It can provide comprehensive support from national to theater levels.
4. It supports...information needs anywhere in the continuum of military operations.
5. [It] is always engaged.¹¹²

The system must simultaneously support multiple echelons. Each echelon focuses its efforts and pulls information rather than waiting for other echelons to push information to it. The division will focus on those products and functions needed to plan, fight, and win battles and engagements. The corps will be the primary echelon to process and analyze current intelligence from echelons above corps (EAC). It will focus on planning and executing major operations across the extended battlefield. EAC will provide support to joint task forces, Army service component commands, and echelons corps and below.¹¹³

The A-Series Divisional MI Battalion

Although MI is transitioning to the A-series TOE, the divisional MI battalions have not fully fielded all of the systems found on the objective TOE (see Appendix 1).¹¹⁴ For example, the battalions will retain Ground Surveillance Radars (GSR) until UAV fielding is complete. Also, the battalions will keep three TRQ-32 intercept/direction finding (DF)

systems, three TLQ-17 electronic attack (EA) systems, and five TSQ-138 intercept/DF systems until the fielding of six Ground Based Common Sensor (GBCS) systems. The GBCS provides communications intelligence (COMINT), electronic intelligence (ELINT), and EA capabilities on a single platform.

In general, the A-series MI battalion has corrected many of the deficiencies noted with its CEWI predecessor and identified by the MI Relook Task Force. The battalion has added IMINT capabilities, reemphasized HUMINT, and scaled back SIGINT. Also, it has markedly improved communications and dissemination through TROJAN SPIRIT, ASAS, and the Ground Station Module/Common Ground Station (GSM/CGS) (see Appendix 2). Interfaces provided by the Intelligence System of Systems further ameliorate the inadequacies noted during DESERT STORM, providing access to corps and EAC sources.

Unfortunately, the A-series battalion is flawed because it retains two features of its CEWI predecessor. First, it provides for a common organizational structure. The emphasis on uniformity in force design degrades the battalion's ability to support the Force XXI division because its intelligence assets may not correspond to its specific needs. Since the threat spectrum model shows that the Force XXI division will conduct an increasing number of OOTW, the disconnect will become more pronounced. For example, SIGINT systems such as the GBCS and Advanced QUICKFIX have minimal utility in OOTW, but all divisions will receive them. The Rand report also recognized the problem, noting that:

the quantity and variety of...SIGINT systems would seem excessive if

the systems were to be equally distributed across all the regions using a common organizational structure. Therefore, they should be authorized to organizations according to specific requirements within a given region and mission.¹¹⁵

Evidently, the MI Relook Task Force ignored this particular recommendation. Similarly, all divisions will have a minimum complement of CI and IPW teams even though HUMINT is the primary intelligence source in OOTW.

The common organizational structure also tends to discourage the development or continuation of unique systems. For example, light weight, portable intercept systems such as the PRD-12 are disappearing from the MI inventory in favor of the GBCS. However, the PRD-12 is an ideal SIGINT asset to complement HUMINT in situations such as Somalia, Haiti, and Bosnia where GBCS provides more capability than is needed or lacks the mobility necessary to operate in remote areas. MI need not field the PRD-12s to all divisions, but they should be available.

The second feature, a flaw common to both CEWI and the A-series MI battalion, is the provision of organic assets at each echelon. The emphasis on organic assets complicates the problems arising from the first feature because assets that may benefit another division are not readily available. For example, a division providing disaster relief in Florida cannot use its CI and IPW teams as intelligence sources because of legal restrictions on gathering information on U.S. citizens. Instead, the division may use its MI assets in roles unrelated to intelligence.¹¹⁶ Hence, the teams may not be available to another division that needs them. This example demonstrates the inefficiency of providing scarce resources to each echelon. CEWI denies each echelon sufficient depth in assets while concurrently reducing the pool of assets above division from which to draw more

support. A former G2 and MI battalion commander shared the same concern in 1990, noting that:

the concept of organic intelligence assets for each corps and division is too expensive, inefficient and becoming less effective. CEWI is not the most effective and efficient vision of the future, given the expected reduction in resources and withdrawal of combat forces from overseas areas.¹¹⁷

The A-Series MI Battalion and Modularity

The two CEWI features that survive in the A-series MI battalion provide continuity in force design, but threaten to undermine the battalion's ability to support the Force XXI division. The following evaluation reveals that modularity is a means towards providing the intelligence capabilities required by the Force XXI division. However, the evaluation also reveals that adherence to the archaic features of CEWI degrades the advantages of modularity. Modular units exhibit the traits of responsiveness, economy of scale, effectiveness, and flexibility. This section uses these traits as criteria to evaluate the A-series MI battalion consistent with the intelligence capabilities required by the Force XXI division.

Responsive units provide the needed capabilities on short notice, a critical requirement for supporting force projection operations. The A-series MI battalion is responsive for two reasons. First, the DISE is an immediately responsive support package created from the resources available in the MI battalion. FM 34-1 notes that the DISE is one of the first tailored packages to deploy with the G2.¹¹⁸ Recent operations by 10th MTN DIV in Somalia and Haiti support this doctrinal claim. Also, the 82nd Airborne Division has used the Mini-DISE to provide en route intelligence support and assured communications to the early entry commander until the lodgment has been secured and

follow-on intelligence support has arrived.¹¹⁹ The DISE provides useful intelligence to the commander because of its connectivity to EAC sources. The DISE is also small in proportion to the quality of support it provides. The DISE ranges in size from five soldiers in the Mini-DISE, manportable version to twelve soldiers in the vehicular-based DISE.¹²⁰ The efficiency of the DISE minimizes its need for limited lift assets.

Second, the A-series MI battalion is responsive because its design generally embraces both the functionally emulative increment (FEI) and modular designed element (MDE) approaches to modularity. The three DS companies are FEIs that provide maneuver brigades with the same intelligence that the division receives. Assets such as UAV, GBCS, and CI are MDEs within the battalion. For example, CI personnel can deploy with the Theater Rapid Response Intelligence Package (TRRIP). The TRRIP is a notebook computer with a printer and scanner. Added to the Mini-DISE or combined with a briefcase satellite communication (SATCOM) radio, the TRRIP provides responsive HUMINT support to an early entry force.¹²¹

Although the battalion is responsive, there is a problem. The battalion's centralized maintenance lacks the personnel and equipment to provide specialized MDEs to deploying units. As a result, a UAV or SIGINT maintenance MDE provides a distinct capability to a tailored intelligence package, but denies that same capability to the remainder of the battalion. TRADOC Pam 525-68 recognizes this problem, stating that:

Low density, highly technical equipment (to include test sets) will be needed forward during most operations. To insure the...parent unit remains mission capable, additional equipment and test sets may have to be added to TOEs...[Likewise,] modularity may require an increase in personnel strength for selected organizations.¹²²

Therefore, the battalion requires some redesigning to provide responsive modules of specialized maintenance support.

The A-series MI battalion exhibits economy of scale, the second trait of modular units. Economy of scale minimizes demands on lift assets, reduces costs, and supports host nations without undermining their legitimacy. Thus, economic units deploy specific capabilities for only as long as required. Again, the DISE provides the best example. In a situation requiring an initial entry force, a Mini-DISE augmented by two HUMINT teams may deploy. After the entry force secures the lodgment, follow-on intelligence assets may deploy. Follow-on assets are usually necessary to focus the intelligence effort according to the needs of the deployed forces. As stated in FM 34-1:

The deployment of follow-on assets allows the commander to transition from IEW support provided primarily by national assets to support from theater or organic assets within the AO. With in-theater assets, the commander can focus the intelligence effort to the resolution required for tactical operations while receiving the unique support available only from national means.¹²³

METT-T drives the composition, type, number, sequencing, and timing of follow-on forces. These forces may include equipment and soldiers from the ACE to build the Mini-DISE into a vehicular-based DISE. Also, a DS Company may deploy with its supported brigade. If IMINT would improve HUMINT collection or assist with force protection, then a section of UAVs could deploy. In essence, the MI footprint in the theater can consist of any combination of battalion assets. Furthermore, if the battalion lacks the capabilities required in the theater, then corps and EAC assets could deploy and interface with the DISE. The 10th MTN DIV's use of the ARL in Haiti is an example of the linkage between an EAC asset and the DISE.

The A-series MI battalion achieves economy of scale for two reasons. First, it consists of modules of capabilities that fit into one of four categories: collectors, communications, processors, and preprocessors. Collectors include CI teams, GBCS, and UAV. The key communications system in the battalion is TROJAN SPIRIT. The primary processor is ASAS and the preprocessors include GSM, CGS, and the MITT. Using combinations of these four categories allows the battalion to create adaptive force packages. Thus, the Mini-DISE may expand into a full battalion deployment and then scale back incrementally based on the situation. Second, the DISE is the focal point for the electronic transfer of capabilities. Using assured communications and access to the System of Systems, the DISE may pull information from remote sources. As the footprint increases, the DISE may require less support from remote sources. However, as the footprint decreases, the DISE can rely again on remote sources.

Regarding the third trait of modular units, the A-series MI battalion is more effective than the CEWI battalion. An effective unit meets the commander's needs and accomplishes the mission. Effectiveness results from adaptive force packaging based on METT-T. The A-series MI battalion is an effective unit as long as it remains within the framework of the System of Systems and is a high priority for EAC support. As noted with responsiveness and economy of scale, the DISE concept yields adaptive force packages when joined with modules of collectors, communications, preprocessors, and processors. Within the context of the System of Systems, these packages can access any source in the intelligence community and are effective in supporting the requirements of

the division. The 10th MTN DIV experience in Haiti demonstrates the abundance of intelligence support that is available to tactical commanders.

Although the A-series MI battalion is more effective than CEWI, it may become ineffective for at least three reasons. First, left to its own devices, the battalion's effectiveness will drop correspondingly. As noted earlier, the intelligence focus at division level is on the products and functions needed to plan, fight, and win battles and engagements. Yet, the division is dependent on EAC sources until the MI battalion can get assets into the theater. As a measure of its own organic capabilities during force projection operations, the battalion is largely a passive observer. Second, if EAC assets are meeting higher priorities that do not correspond to the division's needs, then the DISE's presence will not guarantee effectiveness. Third, depending on the situation, the battalion may not have the assets to support the division. The A-series battalion retains CEWI's feature of a common organizational structure, resulting in a balance of HUMINT, IMINT, and SIGINT assets irrespective of the division's needs. Therefore, the Force XXI division will rely on nonorganic intelligence assets to provide adaptive force packages. It will require manportable SIGINT systems and more HUMINT assets when conducting OOTW, specialized IMINT support when operating in closed terrain, and remote SIGINT support when operating in restrictive terrain or adverse weather.

Finally, concerning the fourth trait of modular units, the A-series MI battalion is more flexible than CEWI. It can adapt to any scenario on the threat spectrum model, function in any terrain and weather, and operate in joint, multinational, and interagency environments. For example, the A-series battalion balances intelligence disciplines,

providing SIGINT, IMINT, and HUMINT support that adapts better than CEWI to disparate threat environments. This TOE reorganization recognizes that SIGINT may be the primary source in conventional operations against a mechanized enemy whereas HUMINT may be the primary source in OOTW. In either case, the other disciplines play supporting roles. Also, the battalion's ability to access intelligence from EAC sources allows it to adjust to the threat, terrain, and weather. In an OOTW scenario characterized by mountainous terrain, poor flying conditions, and a host nation struggling for legitimacy, the DISE can access remote SIGINT and IMINT sources to complement deployed HUMINT sources.

The battalion is also more flexible than CEWI because of its ability to operate in the joint, multinational, and interagency environment. The MI Relook Task Force recognized that the future effectiveness of MI rested in its ability to work beyond the confines of the Army. MI documented this requirement in FM 34-1, noting that, "... we must strive for intelligence organizations and systems which are compatible and interoperable in a joint or combined environment."¹²⁴ In this regard, the battalion is flexible because of the Joint Worldwide Intelligence Communications System (JWICS) and the Joint Deployable Intelligence Support System (JDISS). As Air Force Lieutenant General James Clapper, Director of the Defense Intelligence Agency, notes:

...the JWICS is a sensitive compartmented information (SCI)-secure, high capacity, multi-media communications system that offers the military intelligence community a wide range of capabilities, including secure video and audio services for both video telecasting and teleconferencing...JDISS, on the other hand, is a deployable system that, when tied to JWICS, becomes the interface between the military intelligence community's national and theater intelligence centers and subordinate tactical commands.¹²⁵

Embedded in TROJAN SPIRIT or configured in its briefcase version, JDISS kept deployed brigades linked to the J2 in Port-au-Prince. Furthermore, JDISS and JWICS were available to all services, providing a common intelligence picture at every echelon. The battalion's use of these systems gives it flexibility in a joint, multinational, and interagency environment.¹²⁶

Although the A-series battalion is more flexible than the CEWI battalion, it has significant shortcomings stemming from two causes. First, as with effectiveness, the battalion's flexibility depends on access to the System of Systems. In an environment for which its assets are poorly suited, the battalion lacks flexibility. For example, the GBCS performs best in open terrain against a large, well defined, conventional military force. However, in restrictive terrain against small, unconventional forces, the GBCS is generally ineffective. Hence, the battalion must rely on external support.

The second shortcoming arises from one of CEWI's features. Namely, the A-series TOE relies on the provision of organic assets at each echelon while recognizing that each echelon does not have all the assets it requires. As a former battalion commander noted:

Army Intelligence doctrine [needs] to eliminate the organic assignment preoccupation of CEWI for one which emphasizes the effective and efficient use of limited resources to deliver a timely and usable intelligence product. The false notion that distribution of intelligence resources is the same as intelligence support [should] be replaced by the focus on delivery of intelligence products.¹²⁷

The design of the MI battalion results in a degree of inflexibility because all battalions look alike regardless of the specific needs of their divisions. The A-series MI battalion balances intelligence disciplines to provide greater flexibility, but the lack of variety in SIGINT systems and depth in HUMINT assets may degrade its flexibility. In other words, as long as the division requires capabilities resident in the MI battalion, the battalion is flexible.

However, when it requires augmentation to satisfy its division's requirements, the battalion exhibits dependency and inflexibility.

The evaluation reveals that the A-series MI battalion is more responsive, economical, effective, and flexible than its CEWI predecessor. These traits are the most pronounced when the battalion uses modular approaches. Modularity also supports the intelligence capabilities required by the Force XXI division. However, as a means of achieving these capabilities, modularity depends on two factors. First, it must have readily available access to intelligence systems. Second, it must have access to a wide variety of systems. Undeniably, the A-series battalion provides better access and variety than CEWI.

The A-series battalion retains two features of CEWI that undermine the two factors most important to the success of modularity. These features undermine modularity by limiting access to intelligence systems and reducing the variety of available systems. In short, CEWI is antithetical to modularity. The Intelligence System of Systems tends to obscure the negative effects of CEWI by providing electronic access to a variety of nonorganic assets. As long as the division is a high priority for corps and EAC intelligence support, it will have access to a variety of sources. This dependency begs two questions that lie beyond the scope of this monograph. First, why retain divisional MI battalions that cannot provide the intelligence capabilities required by the Force XXI division unless augmented physically or electronically by corps and EAC sources? Second, would the pooling of assets above division provide the requisite capabilities? Although this monograph does not furnish answers to these questions, such inquiries suggest alternatives to CEWI's surviving features.

Chapter Five

Conclusion

The three previous chapters proved that modularity should serve as the force design methodology for the MI battalion in the Force XXI division. Chapter Two reviewed current and emerging doctrine. The review of current doctrine did not reveal the use of the term modularity. However, FMs 100-5 and 34-1 predated TRADOC Pam 525-68 and thus the absence of the term is not surprising. Nonetheless, the tenets of modularity were clearly in evidence in the manuals' emphasis on force projection operations. As noted in Chapter Two, the tenets of modularity are synonymous with the traits that modularity is intended to produce in units. Units that exhibit the traits of responsiveness, economy of scale, effectiveness, and flexibility are better suited to force projection operations. Modularity facilitates force projection operations through more efficient force tailoring. The DISE is an example of efficient force tailoring arising from the application of modularity.

Unlike current doctrine, emerging doctrine requires modularity. TRADOC Pam 525-5 cites modularity as one of the defining characteristics of Force XXI. The pamphlet also notes that the Army is in the process of creating more modular units to provide efficient force tailoring for a wide variety of missions.¹²⁸ Although it is not authoritative, TRADOC Pam 525-5 provides the intellectual azimuth for change in the Army. It says that the Army must change its organization, create modular combat support units, and experiment with force design. TRADOC Pam 525-XX takes the principles found in TRADOC Pam 525-5 and applies them to the development of Force XXI divisions. TRADOC Pam 525-XX makes modularity one of the key characteristics of the Force XXI

division. The pamphlet also links modularity specifically to intelligence, noting that commanders must put a premium on modularity when tailoring intelligence support packages. Thus, the doctrinal review proved that modularity complements current doctrine and that emerging doctrine requires modularity as the force design methodology for Force XXI.

Using the findings of the MI Relook Task Force, Chapter Three showed that modularity furnishes the three intelligence capabilities needed by the Force XXI division. First, MI must provide intelligence support to force projection operations. Second, MI must support the spectrum of military operations in all terrain and weather conditions. Third, MI must disseminate intelligence to warfighters. The 10th MTN DIV's operations in Somalia and Haiti illustrated likely Force XXI missions. Lessons learned in those operations reveal that the division's intelligence support was most effective when it used modular units. In particular, the DISE and tailored intelligence packages provided the three key intelligence capabilities required by the division. Thus, the DISE supported force projection, modified its composition according to changing conditions, and disseminated intelligence to warfighters. Also, selected modules of capabilities, such as ARL and HUMINT teams, interfaced with the DISE to further support the provision of all three capabilities. Although the 10th MTN DIV did not deliberately set out to test modularity, the unique conditions surrounding the operations led to the use of modular approaches which, in turn, resulted in effective intelligence support.

Chapter Four used the tenets of modularity as criteria to evaluate the A-series MI battalion. The criteria were responsiveness, economy of scale, effectiveness, and

flexibility. The chapter concluded that the battalion is responsive and economical due to modular units such as the DISE and HUMINT teams. The battalion is also effective and flexible when its organic assets are adequate to support division operations. However, the battalion relies on the Intelligence System of Systems during most operations, thereby degrading its own effectiveness and flexibility. In other words, only when the battalion remains a high priority does it receive the support needed to operate in conditions for which it lacks the requisite assets.

Chapter Four also showed that modularity in the A-series MI battalion is a means of providing the intelligence capabilities required by the Force XXI division. However, the battalion embodies two features of CEWI that attenuate the benefits of modularity. These features undermine modularity by limiting access to systems and reducing the variety of available assets. Ironically, the System of Systems compensates for the subversion of modularity by providing modular support such as the NIST and HUMINT teams.

This monograph has shown that modularity is an appropriate force design methodology for the A-series MI battalion as evidenced both in doctrine and practice. Although MI has not proclaimed modularity as its force design methodology, the A-series MI battalion and the Intelligence System of Systems use modular approaches. These approaches are yielding tailored intelligence packages more capable than their CEWI predecessors of supporting Force XXI. Clearly MI is learning from its mistakes, embracing the RMA, and planning for the future. Whether MI's clarity of vision results

from thinking in time streams is uncertain. However, MI seems willing to experiment with change. As noted by a senior Air Force officer in 1994:

Whether this progress is rated by the speed or substance of changes being made, military intelligence is demonstrating not only how to do more with less, but also how to do better as well. This community has implemented more positive changes in the 40 months [following] the Gulf War than in the 160 years since General von Clausewitz counseled military leaders to beware of contradictions, falsehoods, and doubtful character of information.¹²⁹

In general, MI deserves the compliment. However, the legacy of CEWI may stymie further progress. Granted, MI has more than a decade invested in CEWI, an investment that has made MI an integral part of the Army. Nonetheless, CEWI was barely adequate in a forward based Army focused on a single threat. In a force projection Army with a variety of potential threats, CEWI is grossly inadequate.¹³⁰ Although CEWI provides continuity in a period of change, any vestige of CEWI in MI's force design represents suboptimal continuity. Thus, CEWI and modularity are irreconcilable concepts. CEWI seeks standardization in organization and the presence of assets at each echelon as tangible evidence of MI support. Modularity adapts to the fiscal and strategic realities facing MI and is receptive to technological innovations. It permits the creation of a variety of discrete, low density capabilities that can be blended to suit unique scenarios. Modularity emphasizes the provision of intelligence support and does not confuse support with the mere presence of intelligence assets.¹³¹ Therefore, MI should adopt modularity as its force design methodology and discard CEWI both in name and substance.

- ¹ Michael Howard, "Military Science in an Age of Peace," RUSI Journal of the Royal United Services Institute for Defence Studies, no. 119, March 1974, p. 4.
- ² Michael Mazarr, The Military Technical Revolution: A Structural Framework, Washington, D.C.: CSIS, March 1993, p. 16.
- ³ David Jablonsky, The Owl of Minerva Flies at Twilight: Doctrinal Change and Continuity and the Revolution in Military Affairs, Carlisle Barracks, PA: Strategic Studies Institute, May 1994, p. 3
- ⁴ Richard E. Neustadt and Ernest R. May, Thinking in Time: The Uses of History for Decision Makers, New York: The Free Press, 1986, p. 251. Thinking in time streams has three components:
 "[First], ...the future has no place to come from but the past, hence the past has predictive value. [Second],...what matters for the future in the present is departures from the past, alterations, changes, which prospectively or actually divert familiar flows from accustomed channels, thus affecting that predictive value...and [third],...an almost constant oscillation from present to future to past and back, heedful of prospective change, concerned to expedite, limit, guide, counter, or accept it as the fruits of such comparison suggest." Neustadt, p. 251.
- ⁵ Gordon Sullivan, "Not For Themselves, But For Their Country," Address to the graduating class of the Command and General Staff College, Fort Leavenworth, Kansas, 2 June 1995.
- ⁶ U.S. Army Office of the Chief of Staff, Force XXI, Washington, D.C.: Headquarters, Department of the Army, 15 January 1995, introduction.
- ⁷ U.S. Army Intelligence Center, "Intelligence XXI Vision," Presentation Slides, 27 Dec 1994, p. 7.
- ⁸ Peter E. MacDonald and William T. Torpey, "Intelligence Architecture, Echelons Corps and Below (ECB): Some Near Term Alternatives," Student Paper, Carlisle Barracks, PA: U.S. Army War College, 5 April 1991, p. 1.
- ⁹ Paul H. Herbert, Deciding What Has to Be Done: General William E. DePuy and the 1976 Edition of FM 100-5, Operations, Leavenworth Papers No. 16, Fort Leavenworth, KS: Combat Studies Institute, 1988, pp. 6-9.
- ¹⁰ John C. Hammond, "Army Intelligence Future (AIF): An Alternative to CEWI," Student Paper, Newport, RI: U.S. Naval War College, 26 June 1990, p. 2.
- ¹¹ Don E. Gordon, "The CEWI Battalion: A Tactical Concept that Works," Military Review, no. 60, January 1980, p. 12.

- ¹² Leonard G. Nowak, "Division Intelligence: Left in AirLand Battle's Dust?," Military Review, no. 67, November 1987, p. 53.
- ¹³ Ibid., p. 56.
- ¹⁴ John F. Stewart, Jr., "Operation Desert Storm, The Military Intelligence Story: A View from the G-2, 3rd Army," Riyadh, Saudi Arabia: 3rd U.S. Army, April 1991, p.32.
- ¹⁵ Robert L. Heilbroner, The Future as History, New York: Harper & Row, 1960, pp. 193-197.
- ¹⁶ Department of the Army, TRADOC Pam 525-68, Concept for Modularity, Fort Monroe, VA: TRADOC, 10 January 1995, p.3.
- ¹⁷ Giulio Douhet, The Command of the Air, USAF Warrior Studies Reprint, Washington, D.C.: Office of Air Force History, 1983, p. 30.
- ¹⁸ Department of the Army, Field Manual 100-5, Operations, Washington, D.C.: Headquarters, Department of the Army, June 1993, pp. v-vi.
- ¹⁹ TRADOC Pam 525-68, p. foreword.
- ²⁰ Ibid., p. foreword.
- ²¹ Alvin and Heidi Toffler, War and Anti-War: Survival at the Dawn of the 21st Century, New York: Little, Brown and Company, 1993, p. 77.
- ²² TRADOC Pam 525-68, p. 3.
- ²³ Ibid., p. foreword.
- ²⁴ Ibid., p. 3.
- ²⁵ Ibid., p. 3. The other two tenets are selectivity and identification. However, the pamphlet does not make a good case for them as tenets and thus they will not serve as criteria in the monograph. Both "tenets" better serve the purpose of distinguishing modular units from other units. For example, the pamphlet states in conjunction with selectivity that "modularity will be applied to selected organizations that meet the mission profile criteria (e.g., required early in deployment)." Similarly, under identification, the pamphlet states that the "table of organization and equipment (TOE) documentation must clearly identify subelements...designed for modularity so that rapid identification can be made of the minimum Army force package requirements for deployment and effective mission accomplishment."

²⁶ Other approaches include nested modules, functional modules, and forward modules. Nested modules can be formed and combined in multiples of the basic module. For example, two truck squad modules form a truck platoon module, three of which form a truck company module. In the functional module approach, each module performs a separate function. For example, a Petroleum Pipeline and Terminal Operating Company consists of a pipeline platoon module, a terminal operation platoon module, and a storage module. Forward modules consist of elements/units which deploy early to provide a limited capability but which require the rest of the unit to sustain that capability. For example, a forward support platoon module may deploy early to provide a minimal capability, but without the other modules (maintenance, supply, and C&E) it will not be able to sustain the capability. See TRADOC Pam 525-68, p. 5.

²⁷ TRADOC Pam 525-68, p. 4.

²⁸ Ibid., p. 4.

²⁹ Ibid., pp. 4-5.

³⁰ Ibid., p. 4.

³¹ Ibid., p. 5.

³² Ibid., p. 8.

³³ FM 100-5, p. Glossary-6.

³⁴ Department of the Army, Field Manual 101-5-1, Operational Terms and Symbols (initial draft), Washington, D.C.: Headquarters, Department of the Army, January 1994, p. 1-232.

³⁵ FM 100-5, p. 3-4.

³⁶ Ibid., p. 3-1.

³⁷ Ibid., p. 3-5.

³⁸ Ibid., p. 3-5.

³⁹ Ibid., p. 1-1.

⁴⁰ Ibid., p. 5-4.

⁴¹ Department of the Army, Field Manual 34-1, Intelligence and Electronic Warfare Operations, Washington, D.C.: Headquarters, Department of the Army, 27 September, p. v.

- 42 Ibid., p. 3-5.
- 43 Ibid., p. 3-1.
- 44 Ibid. p. 1-7.
- 45 Ibid., p. 1-13.
- 46 Ibid., p. 1-6.
- 47 Ibid.
- 48 Ibid.
- 49 Force XXI, pp. 8-9.
- 50 Ibid., p. 3-1.
- 51 Ibid., p. 3-2.
- 52 Ibid., p. 4-6.
- 53 Department of the Army, TRADOC Pam 525-5, Force XXI Operations, Fort Monroe, VA: TRADOC, 1 August 1994, p. 4-5.
- 54 Department of the Army, TRADOC Pam 525-XX, Force XXI Division Operations Concept, Fort Monroe, VA: TRADOC, 19 May 1995, p. foreword.
- 55 Ibid., pp. 9-10.
- 56 Ibid., p. 10.
- 57 Ibid., p. E-5 to E-6.
- 58 Ibid., p. 17.
- 59 James Woolsey, quoted in Force XXI , p. 8.
- 60 Edison Cesar , et. al., A New Approach for Measuring the Operational Value of Intelligence for Military Operations, Santa Monica, CA: Rand, 1994, p. xxi.
- 61 General Norman Schwarzkopf, quoted in Joint Chiefs of Staff, JCS Pub 2-0, Joint Doctrine for Intelligence Support to Operations, Washington, D.C.: The Joint Chiefs of Staff, p. III-1.

⁶² James P. Marshall, Near-Real-Time Intelligence on the Tactical Battlefield: The Requirement for a Combat Information System, Maxwell Air Force Base, AL: Air University Press, 1989, p. 42.

⁶³ Ibid., p. 43.

⁶⁴ Stewart, p. 31.

⁶⁵ A few officers have attempted to defend CEWI's emphasis on SIGINT. For a typical defense see Daniel F. Baker, "Deep Attack: A Military Intelligence Task Force in Desert Storm," Military Intelligence, no. 17, October-December 1991, p. 39 which notes that:

Apparently, out of regard for allied EW [electronic warfare] capabilities, the Iraqi army had stopped using its radios and radar systems. Instead, they used an extensive network of wire and cable for communications, and visual observation and deception instead of radars. While this tactic frustrated our EW efforts, it did accomplish our mission to neutralize two thirds of the enemy's command and control.

Essentially, Baker argues that SIGINT had a deterrent effect on the Iraqis. The argument would have merit if CEWI's mission was to neutralize the enemy's command and control. However, the mission was to perform the intelligence tasks noted earlier. Thus, if CEWI did deter the Iraqis, it deterred itself out of a job. A more balanced view on the deterrent effect of SIGINT was provided by Quirk, p. 307. He notes that:

This strange turn of events can only be assessed as a success for our SIGINT system. Far from disproving the need for SIGINT, this experience demonstrated that a strong U.S. SIGINT capability places the enemy in a dilemma which will benefit our forces one way or another.

⁶⁶ Brian A. Kellar, "Seeing the Airland Battlefield: Can the Heavy Division Military Intelligence Battalion Do Its Job?," Student Monograph, Fort Leavenworth, KS: School of Advanced Military Studies, 1991, p. 31. See also Patrick Kelley, III, "The Electronic Pivot of Maneuver: The Military Intelligence Battalion," Student Monograph, Fort Leavenworth, KS: School of Advanced Military Studies, 1993. Kelley's monograph provides a counterargument. He contends that CEWI battalions in DESERT STORM were able to keep pace with maneuver forces, noting that "As long as a military intelligence vehicle is not the slowest vehicle on the battlefield, the assertion that mobility depends upon the entire force's ability to traverse a specified piece of terrain guarantees military intelligence mobility." (p. 25) Although he cogently argues his thesis, Kelley fails to convince the reader that the MI battalion's maneuver equates to effectiveness on the battlefield.

⁶⁷ Stewart, p. 27.

⁶⁸ Toffler, p. 80.

⁶⁹ Richard J. Quirk III, "Intelligence for the Division: A G2 Perspective," Student Paper, Carlisle Barracks, PA: U.S. Army War College, 1992, p. 144.

⁷⁰ Ibid., p. 298.

⁷¹ Jeffrey T. Richelson, "Volume of Data Cripples Tactical Intelligence System," Armed Forces Journal International, June 1992, p. 35.

⁷² Alan D. Campen, "Intelligence Leads Renaissance in Military Thinking," Signal, no. 48, August 1994, p. 17.

⁷³ Charles B. Eichelberger, "The MI Corps: A Vision of the Future," Military Intelligence, no. 17, October-December 1991, p. 12.

⁷⁴ Quirk, p. 301.

⁷⁵ J.R. Bondanella, et.al. Estimating the Army's Intelligence Requirements and Capabilities for 1997-2001, Santa Monica, CA: Rand, 1993, p. xx.

⁷⁶ Ibid., p. 32.

⁷⁷ Ibid., p. 24.

⁷⁸ Ibid., pp. 32-33.

⁷⁹ Ibid., p. 31.

⁸⁰ Ibid., p. 33.

⁸¹ Ibid.

⁸² Ibid., p. 38.

⁸³ Ibid., p. xxv.

⁸⁴ 2d Armored Division is currently the Force XXI experimental division. It will reflag as the 4th Infantry Division (Mechanized) on 16 December 1995. The Force XXI experiment focuses on a single brigade and culminates in a series of training events at the National Training Center (NTC) beginning in February 1996.

⁸⁵ FM 34-1, p. 2-8.

⁸⁶ TRADOC Pams 525-5 and 525-XX support this assumption. Both pamphlets charge MI with providing situational awareness, targeting data, force protection, indications and warnings, and intelligence preparation of the battlefield. Battlefield

damage assessment is the only task not specifically mentioned. See TRADOC Pam 525-XX, pp. 11-17 and TRADOC Pam 525-5, pp. 2-7, 2-8, 2-10, 3-6, 3-9, 3-11, 3-19, 3-20, and 4-6.

⁸⁷ TRADOC Pam 525-XX, p. 11.

⁸⁸ Ibid., p. E-4.

⁸⁹ Ibid., p. 11.

⁹⁰ TRADOC Pam 525-5, pp. 2-3 to 2-6. The threat spectrum model addresses phenomenological threats, nonnation forces, internal security forces, infantry-based armies, armor-mechanized-based armies, and complex, adaptive armies.

⁹¹ Bondanella, p. xxvi.

⁹² Ibid., p. 27. The authors add that IMINT in DESERT STORM was able to provide detailed intelligence on Iraqi obstacles, especially minefields. However, IMINT is not effective in detecting minefields in wooded or jungle environments. Given the proliferation of mines and situations like Cambodia and Bosnia, an increased MASINT capability is warranted.

⁹³ TRADOC Pam 525-5, p. 2-8 to 2-9.

⁹⁴ TRADOC Pam 525-XX, p. 17.

⁹⁵ FM 34-1, p. 1-10.

⁹⁶ Bondanella, p. 50.

⁹⁷ Ibid., p. xv.

⁹⁸ TRADOC Pam 525-5, pp. 2-3 to 2-6.

⁹⁹ A note of caution is warranted. This monograph does not claim that senior intelligence leaders set out to test the concept for modularity during these operations. Rather, they are the only post-DESERT STORM examples of intelligence support provided during actual deployments. Also, this monograph does not claim that MI has embraced modularity as its force design methodology. Instead, this monograph cites MI concepts and practices that exhibit modular characteristics.

¹⁰⁰ Patrick M. Madden and Robert Hallagan, "Army Intelligence Split-Based Operations, Military Intelligence, no. 20, April-June 1994, p. 5.

- ¹⁰¹ Center for Army Lessons Learned, Operation Restore Hope Lessons Learned Report: 3 December 1992-4 May 1993, Fort Leavenworth, KS: U.S. Army Training and Doctrine Command, 1993, p. XIV-31.
- ¹⁰² Tania Chacho, "XVIII Airborne Corps CMISE Support in Haiti," Military Intelligence, no. 21, April-June 1995, pp. 14-15.
- ¹⁰³ Thomas R. Wilson, "Joint Intelligence and UPHOLD DEMOCRACY," Joint Force Quarterly, no. 7, Spring 1995, pp. 57-59.
- ¹⁰⁴ S.L. Arnold and David T. Stahl, "A Power Projection Army in Operations Other Than War," Parameters, no. 4, Winter 1993-1994, p. 21.
- ¹⁰⁵ Center for Army Lessons Learned, U.S. Army Operations in Support of UNOSOM II (Coordinating Draft), Fort Leavenworth, KS: U.S. Army Training and Doctrine Command, April 1994, pp. II-7 to II-9.
- ¹⁰⁶ Operation Restore Hope, pp. XIV-28 to XIV-29.
- ¹⁰⁷ Center for Army Lessons Learned, Operation Uphold Democracy Initial Impressions: Haiti D-20 to D+150, Vol. 2, Fort Leavenworth, KS: U.S. Army Training and Doctrine Command, April 1995, pp. 174 and 187. See also Center for Army Lessons Learned, Operation Uphold Democracy Initial Impressions: Haiti D-20 to D+40, Vol. 1, Fort Leavenworth, KS: U.S. Army Training and Doctrine Command, December 1994, p. 108.
- ¹⁰⁸ Haiti, Vol. 1, p. 93. See also Haiti, Vol. 2, p. 175.
- ¹⁰⁹ Haiti, Vol. 2, p. 192. See also Center for Army Lessons Learned, Operation Uphold Democracy Initial Impressions: Haiti, The U.S. Army and United Nations Peacekeeping, Vol. 3, Fort Leavenworth, KS: U.S. Army Training and Doctrine Command, July 1995, p. 50.
- ¹¹⁰ Ibid., p. 182.
- ¹¹¹ Antoine Henri Jomini, The Art of War, Condensed Version, Reprinted in Roots of Strategy Book 2, Harrisburg, PA: Stackpole Books, 1987, p. 539.
- ¹¹² Robert E. Hallagan, "An Introduction to our Intelligence Branch Operational Concept," Military Intelligence, no. 19, January-March 1993, p. 10.
- ¹¹³ Ibid., pp. 10-12.
- ¹¹⁴ MI is rewriting FM 34-10, Division Intelligence and Electronic Warfare Operations. The November 1986 edition is largely obsolete. For information regarding he

System of Systems see Hallagan's article on the Intelligence Branch Operational Concept. For information regarding the fielding of systems, see annex G in U.S. Army Deputy Chief of Staff for Operations-Force Development, The United States Army 1995 Modernization Plan, Washington, D.C.: Department of the Army, 1995.

¹¹⁵ Bondanella, p. xxi.

¹¹⁶ During Hurricane Andrew relief operations in Florida, the MI battalion operated a shelter for the homeless. Although the mission was necessary and rewarding, it was not the most efficient use of a limited resource.

¹¹⁷ John C. Hammond, "CEWI: Vision for the Future?," Military Review, no. 70, June 1990, p. 67. See also John C. Hammond, "Army Intelligence Future (AIF)," Student Paper, Newport, RI: U.S. Naval War College, 26 June 1990. The Intelligence System of Systems concept looks like an intermediate step between CEWI and the AIF. Hammond advocates the provision of independent, forward-stationed, multi-disciplined AIF brigades to each theater. His paper suggests that these brigades would be highly modular, facilitating precise force tailoring for given contingencies

¹¹⁸ FM 34-1, p. 3-5.

¹¹⁹ Madden, p. 6.

¹²⁰ Ibid.

¹²¹ Gordon R. Sullivan, "A Vision for the Future," Military Review, no. 75, May-June 1995, p. 12.

¹²² TRADOC Pam 525-68, p. 8.

¹²³ FM 34-1, p. 1-7.

¹²⁴ Ibid., p. vii.

¹²⁵ Clapper, p. 97. In Haiti, U.S. Atlantic Command fielded the JWICS to JTF-190. Known as the classified Cable News Network, the JWICS served as an ongoing forum for senior intelligence officers to exchange information.

¹²⁶ Haiti, Vol. 2, p. 185.

¹²⁷ Hammond, "AIF," p. 103.

¹²⁸ TRADOC Pam 525-5, pp. 8-9.

¹²⁹ Campen, p. 18.

¹³⁰ The most important outcome of CEWI was that the Army learned about intelligence and the key role it plays in operations. However, CEWI's legacy is that commanders expect their slice of MI assets and tend to equate the presence of MI assets with intelligence support. Technology and fiscal realities are pointing toward the elimination of organic intelligence support. Rather, MI may have to pool resources at higher echelons for fiscal reasons and use technical means to provide equal or better support to commanders. Although pooling is not the subject of this monograph, modularity would obviously facilitate pooling.

¹³¹ The implication is that divisional MI battalions are probably an archaic means of providing intelligence support to the Force XXI division. The division would be better served by a tailored intelligence organization that draws on the entire MI inventory. The utility of the divisional MI battalion is beyond the scope of this monograph.

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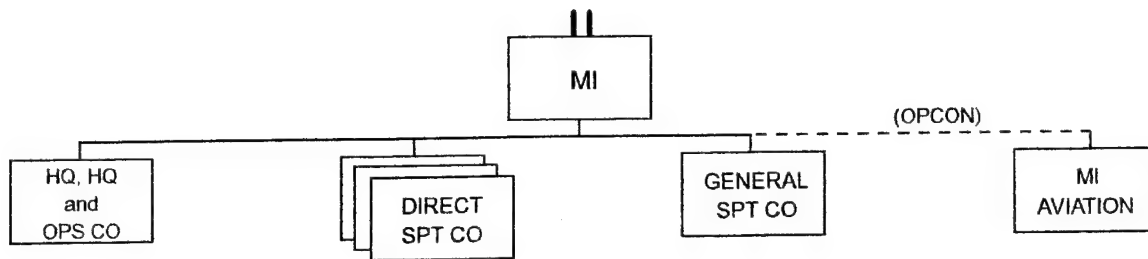
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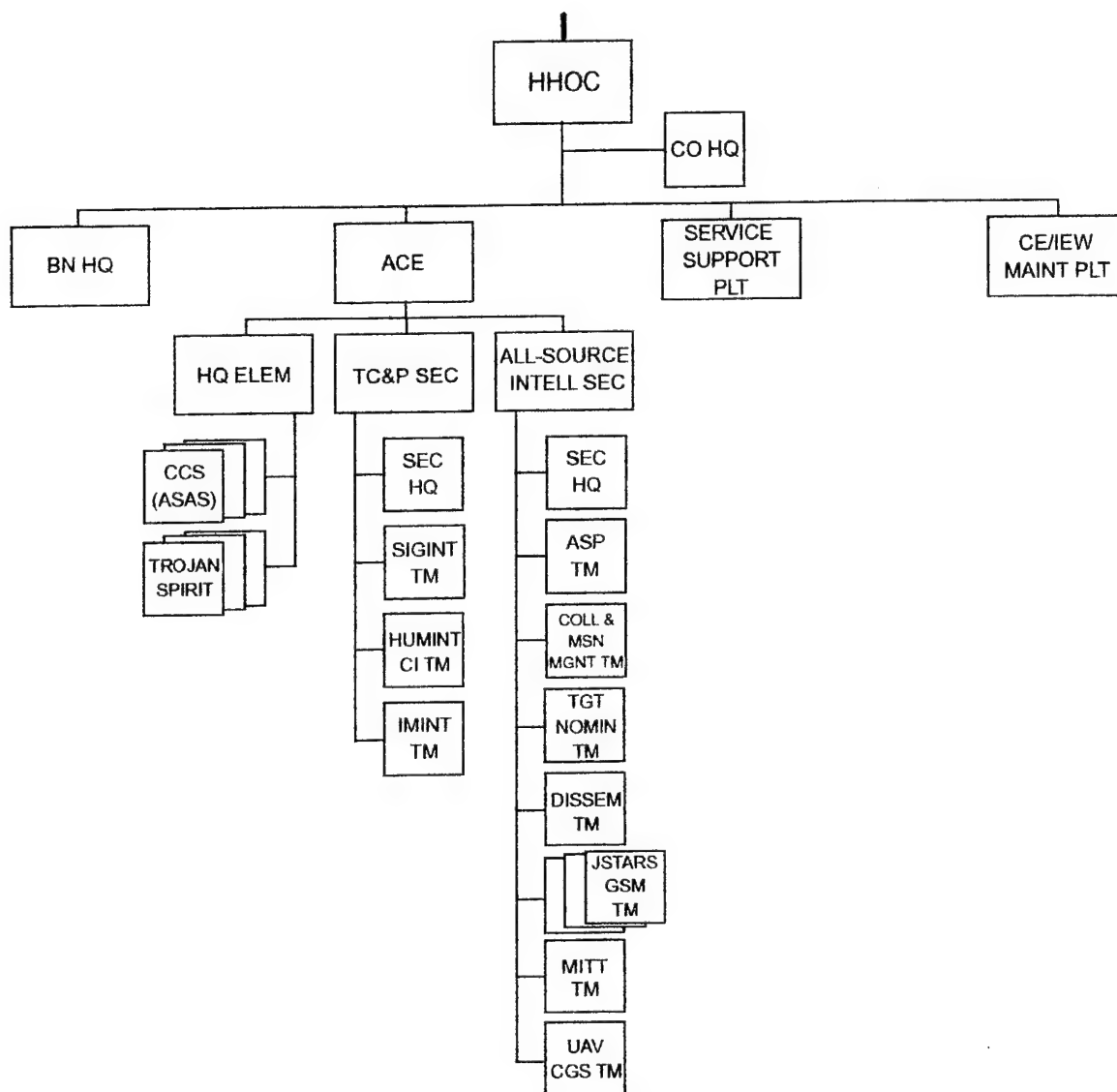
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A-SERIES DIVISIONAL MI BATTALION

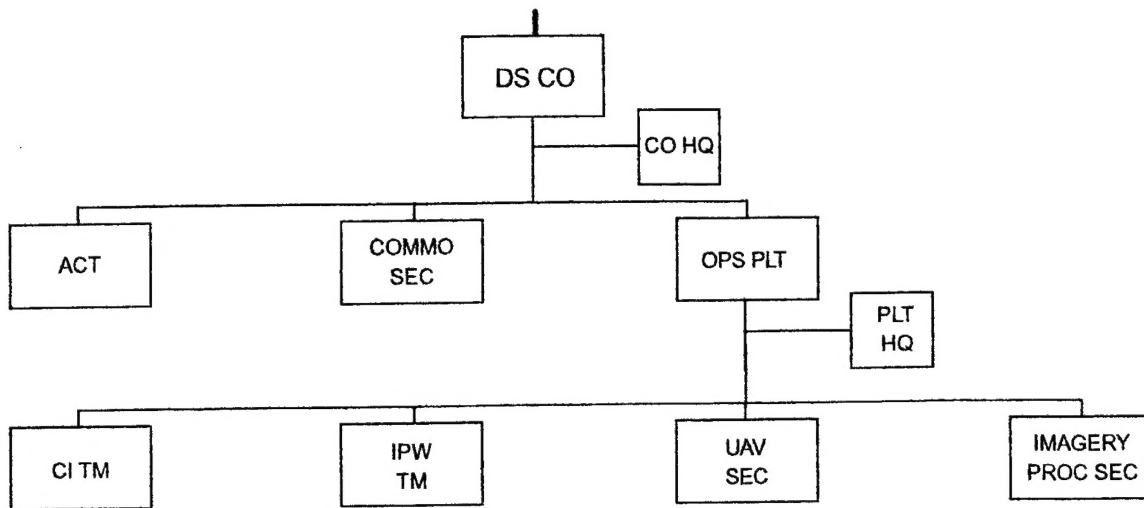


HQ & HQ OPERATIONS COMPANY

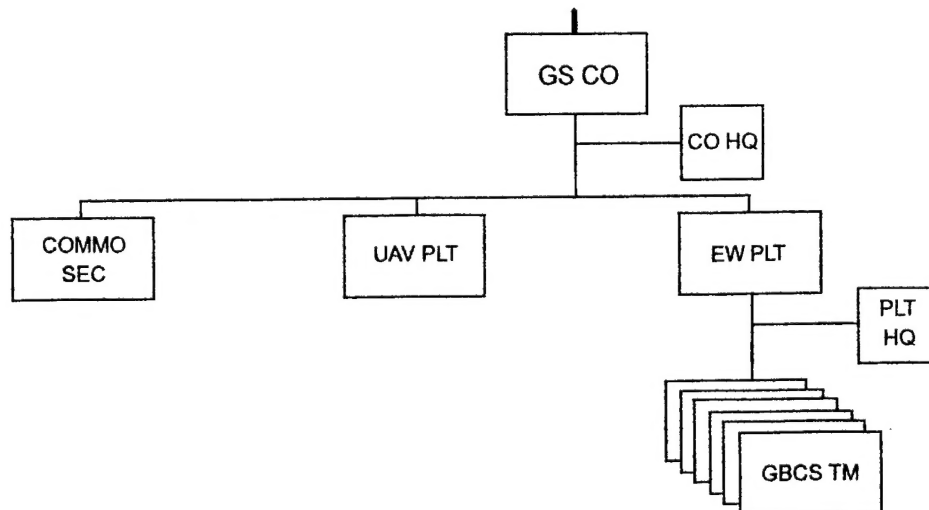


Organizational Charts Derived from Table of Organization and Equipment,
34395A000, Heavy Division, Military Intelligence Battalion

DIRECT SUPPORT COMPANY



GENERAL SUPPORT COMPANY



Organizational Charts Derived from Table of Organization and Equipment,
34395A000, Heavy Division, Military Intelligence Battalion

A-Series Divisional MI Battalion Capabilities

The battalion has five companies, providing multidisciplined DS companies for up to three maneuver brigades and general support (GS) to the division. When fully fielded, the battalion provides the following in GS:

1. An integrated collection management, technical control, and an all-source Analysis and Control Element (ACE) under the control of the G2.
2. Automated intelligence processing, fusion, correlation, display, and dissemination [via Ground Station Module/Common Ground Station (GSM/CGS) and ASAS].
3. Intelligence special purpose communications such as TROJAN SPIRIT.
4. Ground-based and heliborne SIGINT collection and communications jamming (GBCS and Advanced QUICKFIX [AQF]).
5. Enemy prisoner of war interrogation (IPW) and document exploitation.
6. Counterintelligence (CI)
7. Battlefield weather forecasts and effects information (Integrated Meteorological System [IMETS] and Automated Meteorological Sensor System [AMSS]).
8. Secondary imagery dissemination (Mobile Integrated Tactical Terminal).

After receiving all assets, each DS company provides:

1. Automated multidisciplined intelligence and combat information receive, correlation, and display (GSM/CGS).
2. UAV control.
3. IPW and document exploitation.
4. CI.
5. Command and control to accept reinforcing capabilities such as ground-based SIGINT collection and communications jamming.

Capabilities derived from Hallagan, Robert E. "An Introduction to our Intelligence Branch Operational Concept." Military Intelligence No. 19 (January-March 1993): 6-15.

Acronyms

ACE	Analysis and Control Element
ACT	Analysis Control Team
AMSS	Automated Meteorological Sensor System
AO	Area of Operation
AQF	Advanced Quickfix
ARL	Airborne Reconnaissance Low
ASP	All-Source Production
ASAS	All-Source Analysis System
BDA	Battlefield Damage Assessment
CALL	Center for Army Lessons Learned
CCS	Communications Control Set
CE	Communications and Electronics
CEWI	Combat Electronic Warfare and Intelligence
CGS	Common Ground Station
CI	Counterintelligence
CMISE	Corps Military Intelligence Support Element
COMINT	Communications Intelligence
CS	Combat Support
CSS	Combat Service Support
DF	Direction Finding
DISE	Deployable Intelligence Support Element
DS	Direct Support
EA	Electronic Attack
EAC	Echelons Above Corps
ELINT	Electronic Intelligence
EW	Electronic Warfare
FEI	Functionally Emulative Increments
FLE	Forward Logistics Element
FM	Field Manual
FSB	Forward Support Battalion
GBCS	Ground-Based Common Sensor
GS	General Support
GSM	Ground Station Module
GSR	Ground Surveillance Radar
HUMINT	Human Intelligence

IEW	Intelligence and Electronic Warfare
IMINT	Imagery Intelligence
IMETS	Integrated Meteorological System
IPB	Intelligence Preparation of the Battlefield
IPW	Interrogation Prisoner of War
IOSS	Intelligence Organizational Stationing Study
ISE	Intelligence Support Element
I&W	Indications and Warning
JDISS	Joint Deployable Intelligence Support System
JIC	Joint Intelligence Center
JSTARS	Joint Surveillance Target Attack Radar System
JTF	Joint Task Force
JWICS	Joint Worldwide Intelligence Communications System
LLVI	Low Level Voice Intercept
LRC	Lesser Regional Conflict
MASINT	Measurement and Signature Intelligence
MDE	Modular Designed Element
METT-T	Mission, Enemy, Troops, Terrain and Weather, and Time Available
MI	Military Intelligence
MITT	Mobile Integrated Tactical Terminal
MRC	Major Regional Conflict
NIST	National Intelligence Support Team
OOTW	Operations Other Than War
OPCON	Operational Control
RMA	Revolution in Military Affairs
SATCOM	Satellite Communication
SCI	Sensitive Compartmented Information
SIGINT	Signal Intelligence
TC&P	Technical Control and Processing
TOE	Table of Organization and Equipment
TRADOC Pam	Training and Doctrine Command Pamphlet
TROJAN SPIRIT	AN/FSQ-144V, Special Purpose Intelligence Remote Integrated Terminal
TRRIP	Theater Rapid Response Intelligence Package
UAV	Unmanned Aerial Vehicle
UN	United Nations